

# PATENT ABSTRACTS OF JAPAN

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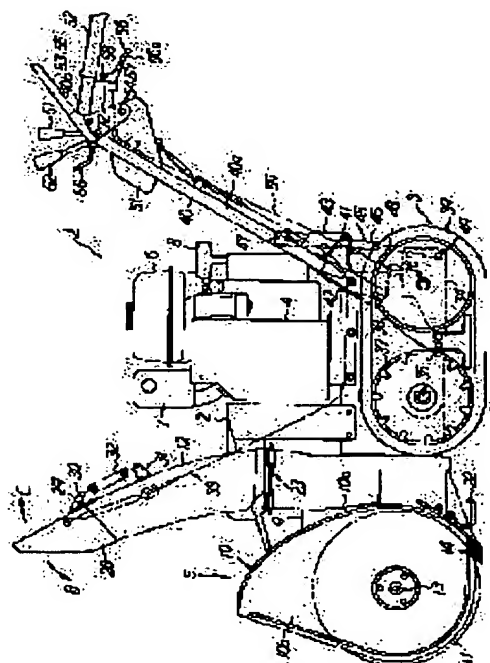
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## (54) TILT MECHANISM FOR SNOWPLOW

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To easily adjust the height of a snowplow part by releasing the lock of a machine body with good operability without removing hands from handles.

**SOLUTION:** This tilt mechanism is provided for a snowplow 1 having a pair of right and left handles 40 attached to the rear of a body 2 and a snowplow part 5 at the front of the body 2, with the entire body 2 supported in such a way as to be vertically rotatable about a drive shaft 35. The tilt mechanism comprises a tilt rod (lock means) 45 for locking the rotation of the body 2 about the drive shaft 35 and a tilt lever 56 which is rotated for undoing the locking of the body 2 by the tilt rod 45. Each handle 40 comprises an inclined part 40a and a horizontal part 40b. A grip 52 for gripping by an operator is provided at the rear end of the horizontal part 40b and a bracket 72 is fixed near the front of the grip 52 of the horizontal part 40b of one of the handles 40. The tilt lever 56 is rotatably journaled to the bracket via a shaft 58 and the part 56a of the tilt lever 56 extending backward from the shaft 58 is opposed to the grip 52 via a space.



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**CLAIMS**

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[Claim(s)]

[Claim 1] Attach the handle of a Uichi Hidari pair in the posterior part of an airframe which carried the engine, and it has the snow removal section which contains an auger in the anterior part of an airframe. The lock means which is the device prepared in the snowblower which supports the whole airframe rotatable up and down centering on the driving shaft of a traveller, and carries out the fixed lock of the rotation centering on said driving shaft of said airframe, In the tilt feature of the snowblower constituted by having the tilt lever of which the lock of the airframe by this lock means is canceled by rotation actuation While constituting said each handle from a ramp which extends from the posterior part of an airframe to the slanting upper part toward back, and a horizontal level which extends at an abbreviation horizontal back continuously from the upper part of this ramp Prepare a grip for an operator to grasp in the back end section of a horizontal level, and a bracket is fixed near the front of said grip of the horizontal level of one handle. The tilt feature of the snowblower characterized by making the part which supports said tilt lever to revolve rotatable through a shaft to this bracket, and extends from the shaft of this tilt lever to back counter said grip through space.

[Claim 2] The tilt feature of the snowblower according to claim 1 characterized by arranging said tilt lever in the opposite side in the vertical direction on both sides of the grip of the transit clutch lever arranged near the grip of said handle of a right-and-left pair, or an auger clutch lever.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the tilt feature prepared in the snowblower which grows into anterior part up and down centering on the driving shaft of a traveller in support of the whole airframe which has the snow removal section rotatable.

[0002]

[Description of the Prior Art] Generally a snowblower prepares the snow removal section which contains an auger in the anterior part of an airframe which carried the engine which is a driving source. Although snow is gathered up in the center of the cross direction of airframe anterior part by rotation of the auger of the snow removal section, this gathered-up snow is attracted by Blois and it discharges from a shooter, advancing an airframe with a traveller In order to adjust the slitting depth to the snow surface of the snow removal section etc., the driving shaft of a traveller is supported for the whole airframe up and down rotatable as a core, and he is trying to adjust the height of the snow removal section etc. by locking and lock canceling an airframe by the tilt feature.

[0003]

[Problem(s) to be Solved by the Invention] However, in the conventional tilt feature, since the control lever which locks rotation of an airframe was arranged in the top face of a control panel (for example, in order to make an auger eat into a snow surface), when raising the snow removal section, the handle was raised with both hands, next the control lever had to be operated, the airframe needed to be locked, and one hand had to be separated from the handle. For this reason, in order to support an airframe and not to go out single hand, the fault of the snow removal section falling had occurred.

[0004] Moreover, in order that an operator might break in before the body on the occasion of the height adjustment of the snow removal section, problems, such as becoming the obstacle of actuation of an operator, also had a control lever and a handle at the time of lock discharge of an airframe.

[0005] This invention was made in view of the above-mentioned problem, and the place made into the purpose is to offer the tilt feature of a snowblower which can cancel the lock of an airframe with sufficient workability and can adjust the height of the snow removal section easily, without lifting a hand from a handle.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 Attach the handle of a Uichi Hidari pair in the posterior part of an airframe which carried the engine, and it has the snow removal section which contains an auger in the anterior part of an airframe. The lock means which is the device prepared in the snowblower which supports the whole airframe rotatable up and down centering on the driving shaft of a traveller, and carries out the fixed lock of the rotation centering on said driving shaft of said airframe, In the tilt feature of the snowblower constituted by having the tilt lever of which the lock of the airframe by this lock means is canceled by rotation actuation While constituting said each handle from a ramp which extends from the posterior part of an airframe to the slanting upper part toward back, and a horizontal level which extends at an abbreviation horizontal back continuously from the upper part of this ramp Prepare a grip for an operator to grasp in the back end section of a horizontal level, and a bracket is fixed near the front of said grip of the horizontal level of one handle. Said tilt lever is supported to revolve rotatable through a shaft to this bracket, and it is characterized by making the part which extends from the shaft of this tilt lever to back counter said grip through space.

[0007] Invention according to claim 2 is characterized by arranging said tilt lever in the opposite side in the vertical direction on both sides of the grip of the transit clutch lever arranged near the grip of said handle of

a right-and-left pair, or an auger clutch lever in invention according to claim 1.

[0008] Therefore, since according to invention according to claim 1 rotation actuation of the tilt lever can be carried out using a hand and a lock means can be canceled, having held the grip since the tilt lever of which a lock means is canceled was prepared so that it might be near the grip of a handle and a grip might be countered through space without an operator lifting a hand from a handle, the height of the snow removal section can be adjusted easily. Moreover, even if it cancels a lock means and the height of the snow removal section changes suddenly, since the operator supported the handle with both hands and is moreover separated from the rotation locus of an airframe, he does not become the obstacle of an operator's activity [ a handle a lever, etc. ].

[0009] According to invention according to claim 2, since the tilt lever was arranged in the opposite side in the vertical direction on both sides of the grip with said transit clutch lever or the auger clutch lever, an operator can do rotation actuation of the tilt lever, with an auger clutch lever or a transit clutch lever grasped, and can cancel a lock means.

[0010]

[Embodiment of the Invention] The gestalt of operation of this invention is explained based on an accompanying drawing below.

[0011] Drawing 1 the top view of this snowblower, and drawing 3 for the side elevation of a snowblower, and drawing 2 The rear view of this snowblower, The expansion sectional side elevation of the scraper part of this snowblower and drawing 5 drawing 4 The top view of this scraper part, The top view of the shooter revolution device section of this snowblower and drawing 7 drawing 6 The side elevation of the shooter part of this snowblower, For drawing 8 , the fracture rear view of the control-panel section of this snowblower and drawing 9 are [ the A-A line expanded sectional view of drawing 9 and drawing 11 of the side elevation of the deflector lever part of this snowblower and drawing 10 ] the top views of the deflector lever of this snowblower, and a shooter switch part.

[0012] 2 is an airframe and is made for this airframe 2 to run with the crawler unit 3 of a Uichi Hidari pair in the snowblower 1 shown in drawing 1 - drawing 3 . And the engine 4 which is a driving source is carried in the center section of this airframe 2, and the snow removal section 5 is formed in anterior part. In addition, as for a fuel tank and 7, in drawing 1 , 6 is [ an exhaust air muffler and 8 ] the knobs of a reverser starter.

[0013] By the way, said snow removal section 5 is constituted including Blois which is not illustrated [ the casing 9 attached in the anterior part of an airframe 2, the auger housing 10 attached in this casing 9, the auger 11 contained pivotable in this auger housing 10, the shooter 12 set up by the top face of casing 9 possible / a level turn /, and / which were contained in casing 9 ].

[0014] The above-mentioned auger housing 10 attaches side-attachment-wall 10b on either side in the both sides of posterior-wall-of-stomach 10a by which curve shaping was carried out, and is constituted by the approximate circle arc, opening of the front face is carried out, and said auger 11 is contained by the interior pivotable. Here, an auger 11 attaches the extra jacket wing which is not illustrated [ spiral ] in the revolving shaft 13 constructed horizontally across both-sides wall 10b of the auger housing 10 pivotable, and is constituted, and the rotation drive of this auger 11 and said Blois is carried out in response to the power transfer from said engine 4.

[0015] Moreover, as shown in drawing 1 and drawing 4 , a scraper 14 covers full and is attached in the lower part of said auger housing 10. This scraper 14 scratches the snow which was not able to be scratched with said auger 11, and the snow which froze over on the ground, and this can shift three sheet metals 16, 17, and 18 of each other with which the edge was fabricated serrate at the edge top of the base plate 15 by which bending shaping was carried out to the shape of a character of \*\*\*\*\* at a cross direction, attaches them to it, and is constituted.

[0016] As shown in drawing 5 , the above-mentioned base plate 15 is concluded by side-attachment-wall 10b of right and left of the both ends of the auger housing 10 with a bolt 19, and pars intermedia is attached in posterior-wall-of-stomach 10a of the auger housing 10 with the bolt 20 of plurality (the example of illustration 7). and it is shown in drawing 4 and drawing 5 -- as -- a base-plate 15 top -- said three sheet metals 16-18 -- plurality (the example of illustration 14) -- bis--- it is attached by 21 possible [ desorption ], and rather than the sheet metal 16 of the maximum upper case, the middle (the 2nd step) sheet metal 17 shifts only predetermined die length to the front, and is arranged, and to the middle sheet metal 17, the sheet metal 18 of the bottom shifts only predetermined die length to the front, and is arranged. Therefore, as shown in drawing 5 , three sheet metals 16-18 form the serration which has a stair-like slant face as a whole.

[0017] In addition, as shown in drawing 1 , the skid 22 for positioning is attached in posterior-wall-of-

stomach 10a of the auger housing 10.

[0018] On the other hand, said shooter 12 is supported by the upper part of casing 9 possible [ a level turn ], and the shooter revolution device 23 shown in drawing 6 does the level turn of this in the range of the illustration include angle theta.

[0019] The above-mentioned shooter revolution device 23 has the motor 24 installed in casing 9 as a driving source, a non-illustrated worm-gearing style slows down and turns rotation of this motor 24, and it is transmitted to the gear 25 of a minor diameter.

[0020] By the way, if the gear 25 of the above-mentioned minor diameter has geared to the sector gear 26 of the major diameter of the shape of a ring attached in a shooter's 12 lower periphery and a gear 25 carries out a forward inversion by the forward inversion of a motor 24 Rotation of this gear 25 is slowed down by sector gear 26, and is transmitted to a shooter 12, this carries out a level turn to right and left in the range of the include angle theta which a shooter 12 shows to drawing 6 , and the eject direction of the snow from this shooter 12 is changed. In addition, the gear tooth is partially engraved only on the range of an include angle theta by sector gear 26. Moreover, as shown in drawing 2 , the dc-battery 27 is arranged by the method of right-hand side of casing 9 (it goes ahead and is a method of right-hand side).

[0021] Moreover, as shown in drawing 1 and drawing 7 , the deflector 28 for changing whenever [ snowy drained-angle-of-repose ] is attached in a shooter's 12 point free [ devotion ] centering on the shaft 29, and the return spring 32 is infixed between this deflector 28, the bracket 30 attached in each tooth back of a shooter 12, respectively, and 31. And the end of a cable 33 is connected with the flank of a deflector 28.

[0022] Here, said crawler unit 3 is explained.

[0023] Between the drive sprocket 37 attached in each edge of a driving shaft 35 and the follower shaft 36 constructed mutually in parallel and free [ rotation ] before and after the track frame 34 of a Uichi Hidari pair shown in drawing 1 and drawing 3 , and the guide wheel 38, the crawler unit 3 of said Uichi Hidari pair loops around the endless-like crawler 39, and is constituted.

[0024] If it \*\* and the rotational motion force of said engine 4 is transmitted to the driving shaft 35 of each crawler unit 3 according to a non-illustrated driving mechanism, the rotation drive of said drive sprocket 37 bound to this driving shaft 35 and this is carried out, the rotation drive of the crawler 39 will be carried out by rotation of the drive sprocket 37, and the snowblower 1 concerned will run a snow surface top by it.

[0025] By the way, the whole airframe 2 equipped with an engine 4 and the snow removal section 5 as mentioned above is supported rotatable up and down considering said driving shaft 35 as a core, and the handle 40 of a Uichi Hidari pair inclines in the slanting upper part toward back, and it is set up by the posterior part of this airframe 2. That is, as each handle 40 is shown in drawing 1 , it consists of horizontal level 40b which extends at an abbreviation horizontal back continuously from the upper part of ramp 40a which extends from the posterior part of an airframe 2 to the slanting upper part toward back, and this ramp 40a, and the grip 52 is put on the back end section of horizontal level 40b. And as shown in drawing 1 and drawing 3 , the lower part of each handle 40 makes a plate 41 intervene in between, and is attached in the flank of an airframe 2 with two bolts 42, the lower part of the bracket 43 of a Uichi Hidari pair is bound with a bolt 44 inside the plate 41 on either side, and joining of the upper part of the right-and-left both ends of each bracket 43 is carried out to the lower part of each handle 40.

[0026] And between the edges which extend in the cross direction center section of the bracket 43 of an above-mentioned Uichi Hidari pair, the edge of the cylinder 46 of the tilt rod 45 as a lock means to constitute a part of tilt feature concerning this invention is connected by the pin 47, and the edge of the rod 48 which extends from the cylinder 46 of the tilt rod 45 to a lower part is connected with the connecting shaft 49 constructed across horizontally between the posterior parts of the track frame 34 of said Uichi Hidari pair.

[0027] Said rod 48 with which the above-mentioned tilt rod 45 was fitted in free [ sliding of a part ] in said cylinder 46 and this cylinder 46 here, The lock device in which it does not illustrate [ which is built in a cylinder 46 and locks sliding of said rod 48 on a stepless story ], It is constituted including the release lever 50 prepared in the flank of a cylinder 46, and by making the hoop direction of a cylinder 46 rotate a release lever 50, the lock of the rod 48 by said lock device is canceled, and this rod 48 can slide freely to a cylinder 46. In addition, the detail of the configuration of the tilt rod 45 and an operation is referring to JP,9-158906,A.

[0028] On the other hand, the control panel 51 is formed between the upper parts of the handle 40 of said right and left, as shown in a detail at drawing 8 , near the grip 52 of the left-hand side handle 40, the transit clutch lever 53 is formed rotatable centering on a shaft 54, and the auger clutch lever 55 and the tilt lever 56 are formed rotatable centering on shafts 57 and 58 near the grip 52 of the right-hand side handle 40,

respectively. That is, as shown in drawing 1 , the bracket 72 is being fixed near the front of the grip 52 of horizontal level 40b of the right-hand side handle 40, and said tilt lever 56 is supported to revolve by this bracket 72 free [ rotation ] through the shaft 58. And extension section 56a which extends from the shaft 58 of a tilt lever 56 to back has countered the grip 52 through space, as shown in drawing 1 , and among both, a member does not exist at all.

[0029] When a non-illustrated transit clutch is turned on if this is grasped, and this transit clutch is turned on, the power of an engine 4 is transmitted to a crawler unit 3, this crawler unit 3 drives the above-mentioned transit clutch lever 53, and a snowblower 1 is made it to run by this. Moreover, if said auger clutch lever 55 turns on a non-illustrated auger clutch if this is grasped, and this auger clutch is turned on, the power of an engine 4 will be transmitted to an auger 11, the rotation drive of this auger 11 will be carried out, and necessary snow-removal work will be made.

[0030] By the way, as shown in drawing 1 , said tilt lever 56 is connected with the release lever 50 of said tilt rod 45 through the cable 59, if this tilt lever 56 is grasped, a release lever 50 will be made to rotate through a cable 59, the lock of the tilt rod 45 will be canceled, and when a tilt lever 56 is detached, the tilt rod 45 is locked again.

[0031] On the other hand, as shown in drawing 8 , the main switch 60 is arranged in the part near the handle 40 of the right-hand side on said control panel 51, and the gearshift lever 61 which can be concentrated on a cross direction is formed in the center of the cross direction of this control panel 51. if it is a switch of snowblower 1 order \*\*, and a thing for travel-speed adjustment, a snowblower 1 will move forward if this is pushed down to the front from the neutral condition of an abbreviation vertical shown in drawing 1 , and this gearshift lever 61 is toppled back conversely -- a snowblower 1 -- going astern -- the -- it falls and a travel speed changes according to an angle.

[0032] Moreover, it is on the left-hand side of said gearshift lever 61 of a control panel 51, and the deflector lever 62 which can be concentrated on a cross direction is formed in the mid-position of this gearshift lever 61 and said transit clutch lever 53. That is, as shown in a detail, the bracket 64 which rotates a shaft 63 as a core is bound to the lower limit of this deflector lever 62 at drawing 9 , and the other end of said cable 33 (refer to drawing 1 ) connected with said shooter 12 is connected with this bracket 64.

[0033] If it \*\* and the above-mentioned deflector lever 62 is pushed down to the front to the chain-line location of drawing 9 centering on a shaft 63 If the deflector 28 which a cable 33 is lengthened and is shown in drawing 1 inclines ahead (the direction of arrow-head B of drawing 1 ) centering on a shaft 29 and pushes down the deflector lever 62 back to the chain-line location of drawing 9 centering on a shaft 63 conversely A cable 33 loosens, a deflector 28 is lengthened with said return spring 32, and inclines back (the direction of arrow-head C of drawing 1 ) centering on a shaft 29, and whenever [ snowy drained-angle-of-repose ] is changed by this.

[0034] Moreover, as shown in drawing 8 - drawing 11 , the pipe 65 has inserted in the deflector lever 62 rotatable to sliding ease and a hoop direction up and down, the shooter rotation lever 66 of the shape of the round bar bent in the shape of [ of \*\*\*\*\* ] a character is bound to the upper limit section of this pipe 65, and the end face section of an arm 67 is bound to the lower limit of this pipe 65 in the direction of an axial right angle. In addition, the above-mentioned shooter rotation lever 66 is arranged in the location within the limits which the digiti manus of the operator who grasped knob 62a of the deflector lever 62 reaches.

[0035] By the way, as shown in drawing 9 and drawing 10 , semicircle-like concave 65a is formed in a part of top face of said pipe 65. This pipe 65 is always energized up with the spring 68 \*\*\*\*(ed) between said arms 67 and brackets 64 of the periphery of the deflector lever 62. Said concave 65a moreover formed in the edge engages with the pin 69 which protruded on the flank of the deflector lever 62, and the location is regulated. In addition, when a pin 69 engages with concave 65a formed in the top face of a pipe 65 as mentioned above, as shown in drawing 11 , said shooter rotation lever 66 turns to the front, and holds the center valve position.

[0036] On the other hand, as shown in drawing 11 , the shooter switch 70 is fixed on the horizontal level part of said bracket 64, and since this shooter switch 70 rotates to one with said deflector lever 62, the relative position between both is kept constant and does not produce trouble in rotation actuation of the deflector lever 62.

[0037] The above-mentioned shooter switch 70 is contained in the control panel 51, as shown in drawing 8 , and switch-lever 70a which concentrates on right and left as the chain line shows from the center valve position of a vertical shown in drawing 8 as a continuous line is prepared in this. And it is connected by the wire-like link member 71 and, as for this switch-lever 70a and the edge of said arm 67, these link members 71 and arms 67 constitute the link mechanism.



[0038] If it \*\*, the shooter rotation lever 66 is operated with a finger while the operator had grasped knob 62a of the deflector lever 62, and this is turned to right and left. The arm 67 bound to the lower limit of the pipe 65 to which this shooter rotation lever 66 is bound, and this pipe 65 rotates right and left in one. Rotation of an arm 67 is transmitted to switch-lever 70a of the shooter switch 70 through the link member 71, and this switch-lever 70a concentrates it on right and left. It circles right and left in the range of the include angle theta which the forward inversion of the motor 24 (refer to drawing 6) of said shooter revolution device 23 is carried out, and a shooter 12 shows to drawing 6, and the eject direction of the snow from this shooter 12 is changed by this.

[0039] In addition, as mentioned above, since concave 65a formed in the top face is engaging with the pin 69, when a pipe 65 lifts a finger from the shooter rotation lever 66, this shooter rotation lever 66 returns to a center valve position, and the energization to a motor 24 is turned off. Moreover, switch-lever 70a of the shooter switch 70 is also energized in the neutral direction with the non-illustrated spring.

[0040] Next, an operation of the snowblower 1 which has the above configuration is explained.

[0041] If the transit clutch lever 53 is grasped where a gearshift lever 61 is toppled ahead after turning on said main switch 60 on a control panel 51, pulling the knob 8 (refer to drawing 1) of a reverser starter and starting an engine 4, a non-illustrated transit clutch will be turned on, the power of an engine 4 will be transmitted to a crawler unit 3, this crawler unit 3 will drive, and a snowblower 1 will move forward. In addition, if a gearshift lever 61 is toppled back, a snowblower 1 will go astern.

[0042] If the auger clutch lever 55 is grasped when it \*\* and a snowblower 1 moves to a work site, a non-illustrated auger clutch will be turned on, the power of an engine 4 will be transmitted to an auger 11, the rotation drive of this auger 11 will be carried out, and snow will be gathered up in the center of the cross direction. And this gathered-up snow is attracted by Blois which is not illustrated [ which was contained in casing 9 ], and is discharged by the shooter 12, it does in this way, and necessary snow-removal work is made.

[0043] In addition, even if it lifts a hand from the auger clutch lever 55 once grasped in the condition that grasp the transit clutch lever 53 and the snowblower 1 is running, an auger clutch maintains ON condition, an auger 11 rotates as it is and snow-removal work is continued. And if a hand is lifted from the transit clutch lever 53, both a transit clutch and an auger clutch will be turned off, and transit of a snowblower 1 and rotation of an auger 11 will be suspended by coincidence.

[0044] By the way, if knob 62a of the deflector lever 62 is grasped and this deflector lever 62 is pushed down forward and backward during the above-mentioned snow-removal work, a deflector 28 will tilt in the arrow head B or the direction of C of drawing 1 as mentioned above, and whenever [ snowy drained-angle-of-repose ] will be changed. And if the shooter rotation lever 66 is turned to right and left with a finger while the operator had grasped knob 62a of the deflector lever 62, a level turn will be carried out to right and left within the limits of the include angle theta which a shooter 28 shows to drawing 6 as mentioned above, and the eject direction of the snow from this shooter 12 will be changed.

[0045] moreover, in case the slitting depth to the snow surface of an auger 11 etc. is adjusted. Since the release lever 50 of the tilt rod 45 will be operated through a cable 59 as mentioned above and the lock of the tilt rod 45 will be canceled, if said tilt lever 56 is grasped, A driving shaft 35 can be rotated for an airframe 2 up and down as a core, by this, the height location of the auger 11 of the snow removal section 5 can be changed, and the slitting depth to the snow surface of this auger 11 etc. can be changed.

[0046] And if a hand is lifted from a tilt lever 56 after adjusting the height of an auger 11, the tilt rod 45 is locked as mentioned above, and rotation centering on the driving shaft 35 of an airframe 2 is also locked.

[0047] Since it \*\* and sliding of a rod 48 is locked in stepless in the tilt rod 45, the height of the snow removal section 5 can be finely tuned easily also in snow-removal work.

[0048] A tilt lever 56 moreover, near the grip 52 of one handle 40. And since it prepared so that a grip 52 might be countered through space, the grip 52 has been held, without an operator lifting a hand from a handle 40. Rotation actuation of the tilt lever 56 can be carried out using a hand, the lock of the airframe 2 with the tilt rod 45 can be canceled, a driving shaft 35 can be rotated for this airframe 2 as a core, and the height of the snow removal section 5 can be adjusted easily. And even if it cancels the lock of the airframe 2 with the tilt rod 45 and the height of the snow removal section 5 changes suddenly, since the operator supported the handle 40 with both hands and is moreover separated from the rotation locus of an airframe 2, he does not become the obstacle of an operator's activity [ handle 40 grade ].

[0049] Furthermore, since the tilt lever 56 was arranged in the auger clutch-lever 55 bottom arranged above the grip 52 of the right-hand side handle 40, an operator can operate a tilt lever 56, with the auger clutch lever 55 grasped, and can cancel the lock of the tilt rod 45. In addition, a tilt lever 56 may be arranged under

the left-hand side transit clutch lever 53.

[0050] Moreover, since according to the gestalt of this operation the cylinder 46 and release lever 50 of the tilt rod 45 were attached in the airframe 2 side and the rod 48 was attached in the crawler unit 3 side, even if a rod 48 carries out stretching movement, hardly immobilite is maintained, and the relative position of this release lever 50 and a tilt lever 56 changes, but management of the cable 59 which connects both the levers 50 and 56 easy-izes a release lever 50. And [0051] from which invasion in the cylinder 46 by free fall, such as water and snow, is protected in order that opening of the cylinder 46 of the tilt rod 45 may turn to the bottom in this case

[Effect of the Invention] Since the tilt lever of which a lock means is canceled by the above explanation according to [ so that clearly ] invention according to claim 1 was prepared so that it might be near the grip of a handle and a grip might be countered through space, an operator can do rotation actuation of the tilt lever using a hand, can cancel a lock means, having held the grip without lifting a hand from a handle, and can adjust the height of the snow removal section easily. Moreover, even if it cancels a lock means and the height of the snow removal section changes suddenly, since the operator supported the handle with both hands and is moreover separated from the rotation locus of an airframe, he does not become the obstacle of an operator's activity [ a handle a lever, etc. ].

[0052] According to invention according to claim 2, since the tilt lever was arranged in the opposite side in the vertical direction on both sides of the grip with said transit clutch lever or the auger clutch lever, an operator can do rotation actuation of the tilt lever, with an auger clutch lever or a transit clutch lever grasped, and can cancel a lock means.

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[Translation done.]



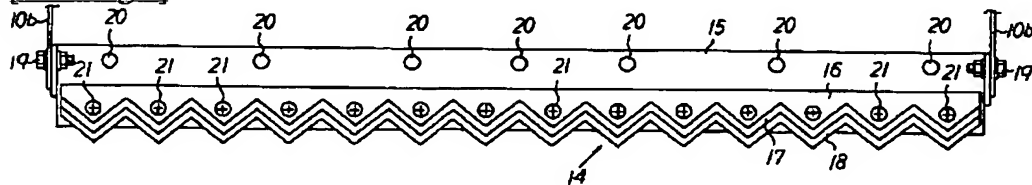
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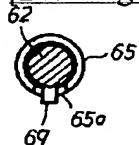
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## DRAWINGS

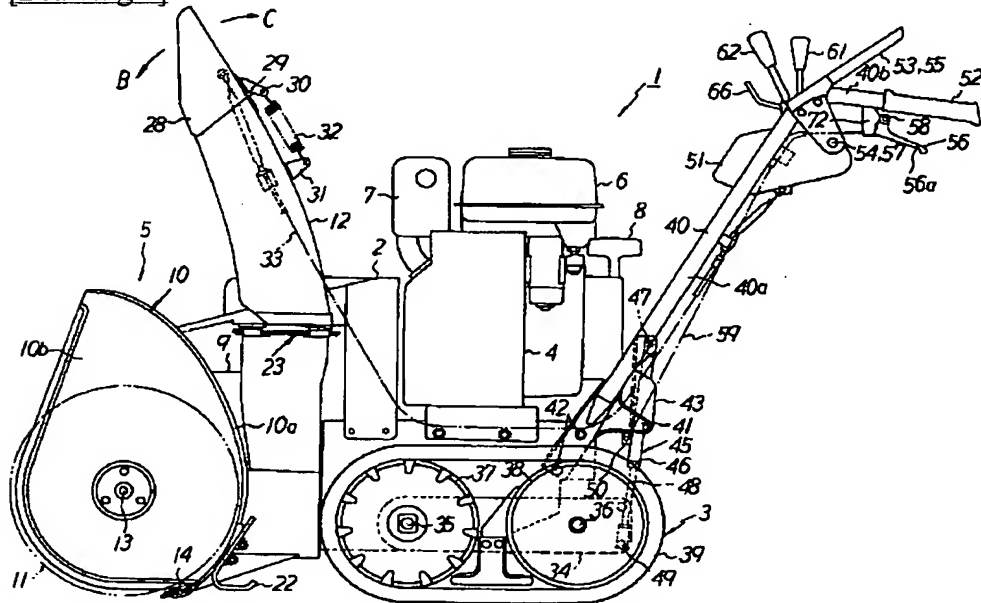
[Drawing 5]



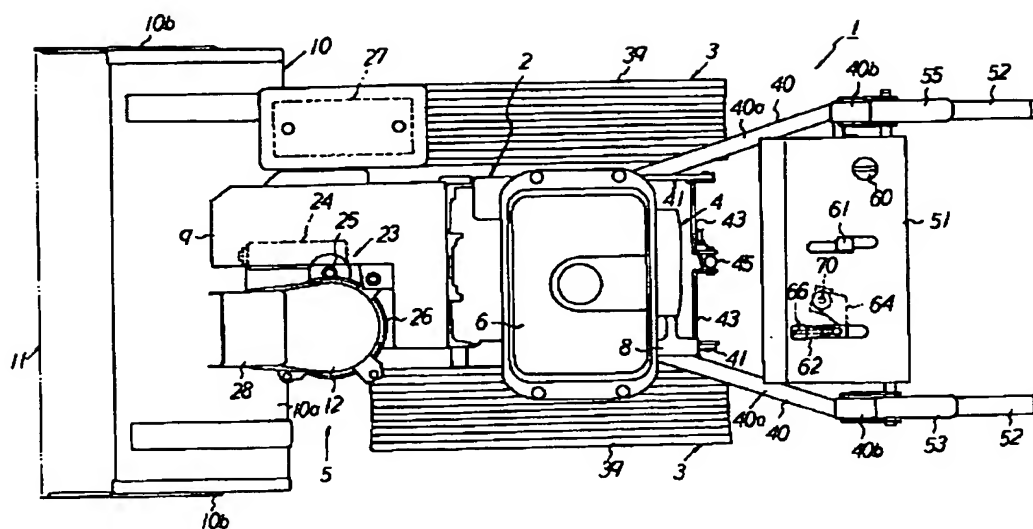
[Drawing 10]



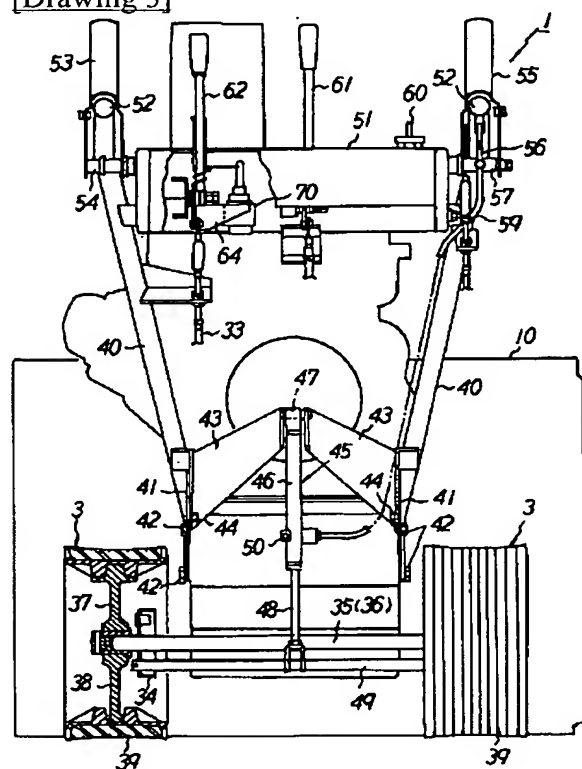
[Drawing 1]



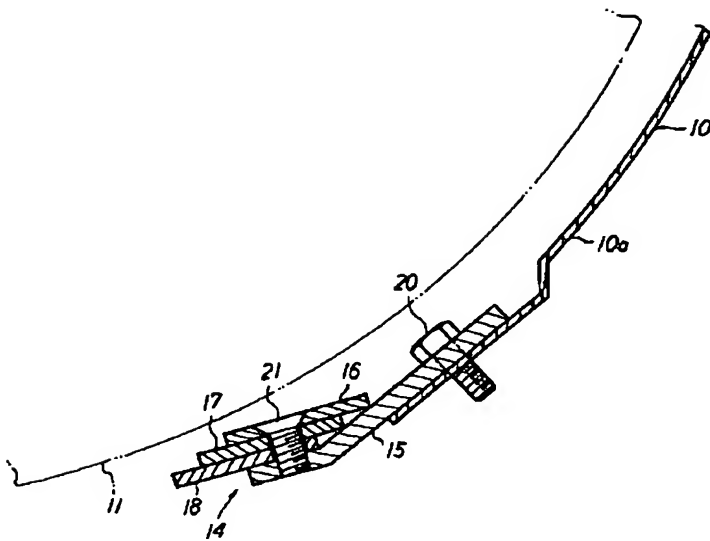
[Drawing 2]



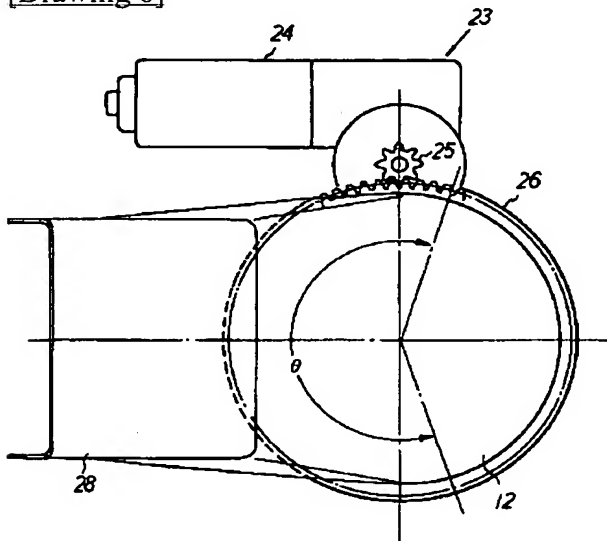
[Drawing 3]



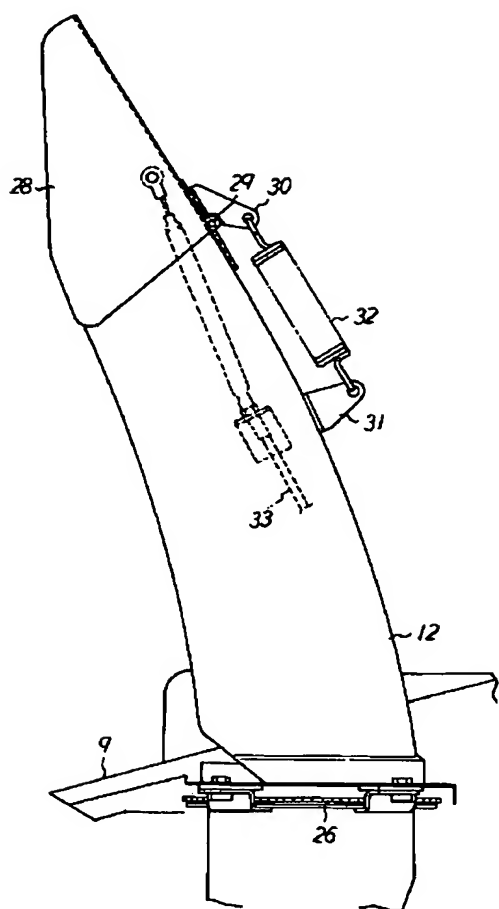
[Drawing 4]



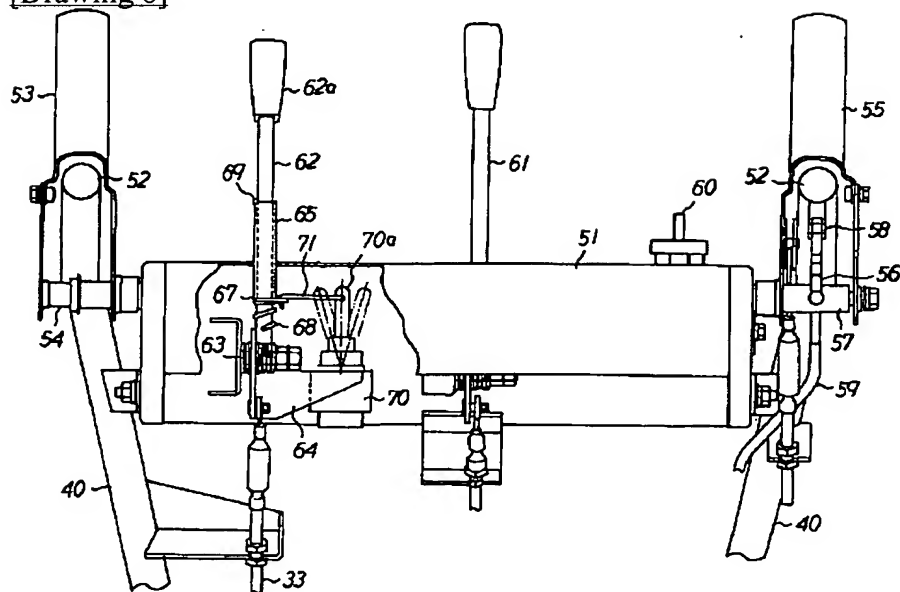
[Drawing 6]



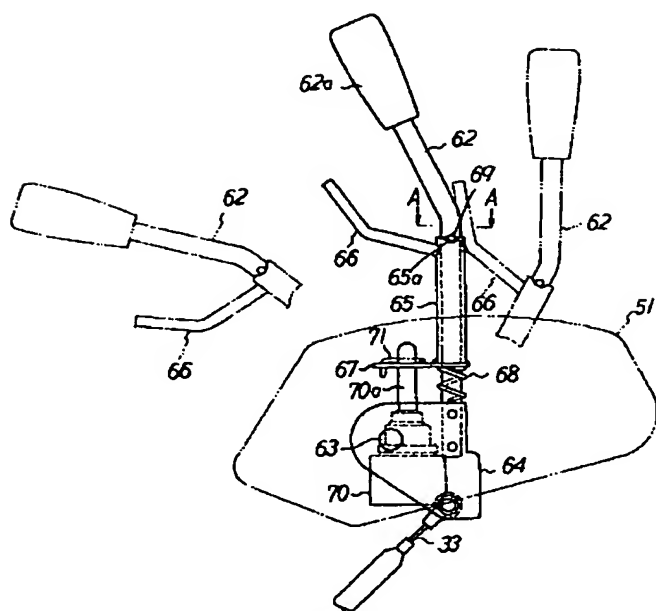
[Drawing 7]



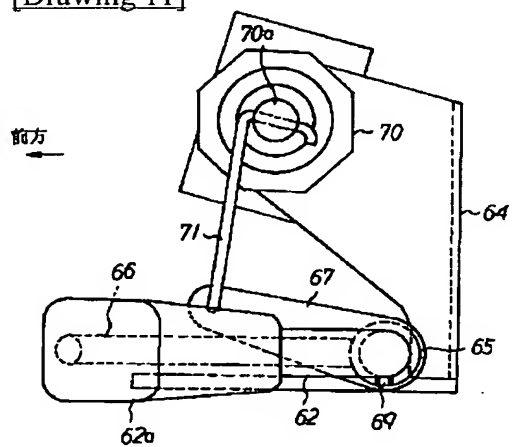
[Drawing 8]



[Drawing 9]



[Drawing 11]



[Translation done.]